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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,507	01/12/2006	Toshiaki Shimizu	MAT-8793US	9289

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EXAMINER
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KRAMSKAYA, MARINA

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/564,507

Applicant(s)

SHIMIZU ET AL.

Examiner

Marina Kramskaya

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 01/12/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 2 is objected to because of the following informalities: Claim 2 fails to recite a positive method step.

The examiner proposes the following amendment:

“2. The method for determining the deterioration of a capacitor according to Claim 1, further comprising:  
displaying ~~wherein when~~ the impedance characteristic ~~is displayed~~ such that a frequency value is higher while moving along a horizontal axis to the right and an impedance value is higher while moving along a vertical axis to the top,  
locating the inflection point at is a first inflection point having a convex shape to the top and locating another inflection point different from the first inflection point at is a second inflection point having a convex shape to the bottom.”

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Miller et al., US 6,151,969.

As per Claim 1, Miller disclose a method for determining deterioration of a capacitor (**10**, see column 3, lines 43-50) including a pair of electrode bodies ("reference electrode" and "working electrode") and electrolytic solution (within "electrolyte cavity") provided between the electrode bodies by applying an AC voltage to the capacitor (**10**) to measure an impedance characteristic (column 1, lines 53-60, via impedance measurement unit **22**) at a frequency of the AC voltage (see FIG. 4B for impedance characteristics over a range of frequencies), comprising:

previously calculating an inflection point (i.e. first inflection point on FIG. 4B at about  $1e+2$  Hz) appearing in the impedance characteristic ("modulus", FIG. 4B) due to the deterioration of the electrolytic solution to compare a characteristic value based on an impedance value (as shown in FIG. 4B) in a frequency region lower than the inflection point with a predetermined characteristic value ("pre-fatigue" value), thereby determining the deterioration (i.e. fatigue, ABS., lines 5-8).

As per Claim 2, Miller further discloses a method for determining the deterioration of a capacitor, wherein when the impedance characteristic is displayed such that a frequency value is higher while moving along a horizontal axis to the right (see horizontal axis of FIG. 4B labeled "Frequency (Hz)") and an impedance value is higher while moving along a vertical axis to the top ((see vertical axis of FIG. 4B labeled

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"Absolute Value  $|Z|$ "), the inflection point (first inflection point at around  $1e+2$  Hz) is a first inflection point having a convex shape to the top (see "modulus") and another inflection point different (second inflection point at around  $1e+4$  Hz) from the inflection point is a second inflection point having a convex shape to the bottom (see "modulus").

As per Claim 3, Miller discloses the method for determining the deterioration of a capacitor as applied to Claim 2, above. Miller further discloses that the characteristic value ("pre-fatigue" value) is an impedance value (see FIG. 4A) at a frequency that is lower than the first inflection point and that is higher than the second inflection point.

As per Claim 4, Miller discloses the method for determining the deterioration of a capacitor as applied to Claim 2, above. Miller further discloses that the characteristic value is a value that is calculated based on a correlation between an impedance value that is calculated by previously deteriorating same type capacitor (i.e. comparison between pre-fatigue capacitor to a partially fatigued capacitor as in FIG. 4A) and a DC capacitor resistance (see FIG. 8 for inverse resistance values) value at a frequency lower than the first inflection point and higher than the second inflection point.

As per Claim 5, Miller discloses the method for determining the deterioration of a capacitor as applied to Claim 2, above. Miller further discloses obtaining the characteristic value of a capacity component based on the voltage change (using voltmeter  $V$  in FIG. 1, and monitoring the voltage output in FIG. 3A) due to the self-

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discharge of the capacitor (10), which inherently discharges over a period of time. The system monitors the voltage at a range of frequencies, as generated by the signal source of FIG. 2, these frequencies including range of frequencies that are lower than the first inflection point and lower than the second inflection point.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kamitani, US 6,285,193, Vette, US 4,216,424, and King, US 6,169,395, disclose a method for testing electrolytic capacitors.

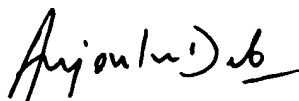
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached (571)272-2168. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MK



**ANJAN DEB**  
**PRIMARY EXAMINER**

Marina Kramskaya  
Examiner  
Art Unit 2858

